multi-tone [an] acoustic signal and transmits a corresponding radio signal[, said RF equipped] in the form of first digital audio samples, the portable wireless communication device comprising:

an RF module that receives the first digital audio samples via an RF [a radio] link;

a microphone that receives the multi-tone [an] acoustic signal;

a CODEC that converts the [said] received multi-tone acoustic signal to second digital audio samples; and

a processor that:

compares the first digital audio samples against the second digital audio samples to determine if they match, and if the first digital audio samples match the second digital audio samples, then

determines the time difference between the arrival of the [said] first digital audio samples and the multi-tone [said] acoustic signal; and

determines the distance from the [said second] RF equipped POS device based on the known speed of propagation of radio waves, the known speed of sound, and the time difference between the arrival of the [said] first digital audio samples and the multi-tone [said] acoustic signal.

10. (Cancelled).

11. (Currently Amended) The portable wireless communication [RF equipped] device of claim 9 wherein the RF [said radio] link is Bluetooth™.

Claims 12-14 (Cancelled).

REMARKS

The claims have been amended to more specifically define the environment of the present invention as that of a distance determining system and method between a portable wireless communication device and an RF equipped POS device. The acoustic signal used has been further refined to be a multi-tone acoustic signal to provide both fine distance resolution and ambiguity resolution. The subject matter of claim 2 has been incorporated into claim 1. Similarly the subject matter of old claims 6

and 7 have been combined and the subject matter of old claims 9 and 10 have been combined. Claims 12 -14 have been canceled.

The 35 USC 112(1) rejection of claim 1 has been addressed by re-wording the phrase "creating an acoustic waveform" to "creating a multi-tone acoustic signal". Support for this wording can be found in paragraph 25 of the specification.

The Examiner has applied US Pat. No. 4,746,912 under 35 USC 102(b) to reject, among others, independent claims 6 and 9. In supporting his rejection the Examiner states that Clifford teaches "converting the received acoustic alarm signal to an audio signal". The applicant intended to convert the received acoustic alarm signal which is an analog signal into a digital signal. This is clearly something that the '912 patent does not teach as evidenced by figures 3 and 4 of the patent and the supporting description in the specification. Applicant has amended the claims to clarify that the conversion is from an analog signal to a digital signal. The purpose of the conversion is to allow a comparison of the received digital RF signal with a digitized version of the received acoustic analog signal to ensure a match. By comparing a digital signal to another digital signal an exact match can be determined. Comparing a digital RF signal to an acoustic analog signal can not determine if the signals are a corresponding match with one another.

Thus, applicant believes that claims 6 and 9 as well as their respective dependent claims as amended are not anticipated by the '912 patent for the reasons stated above. Applicant respectfully requests that the 35 USC 102(b) rejection cited in paragraph 5 of the most recent office action be reconsidered and withdrawn.

The Examiner has applied US Pat. No. 4,746,912 in view of US Pat. No. 6,201,802 and further in view of US Pat. No. 4,313,183 under 35 USC 103(a) to reject, among others, claims 1 and 2. Since claim 2 has been merged into claim 1, applicant will address the Examiner's rejection of old claim 2. The '183 patent is cited against the present invention as teaching "comparing the first digital audio samples against the second digital audio samples to determine if they match". This is the subject matter of old claim 2 that has now been merged into amended claim 1. The '183 patent, however, does **not** teach "comparing the first digital audio samples against the second digital audio samples to determine if they match".

In the present invention the first digital audio samples are clearly defined as a digitized bit stream that was transferred via an RF link while the second digital audio

samples are clearly defined as a digitized version of the received multi-tone acoustic signal that was transmitted acoustically.

The '183 patent does not compare a received RF signal to a received acoustic signal because the '183 patent does not transmit or receive an RF signal. In the cited portion of the reference (col. 3, lns. 40-66), the '183 patent teaches transmitting and receiving an acoustic signal **only** as is clear since the terminology employed by the '183 patent references an "*audible* FSK bit sequence".

The intent of the '183 patent is to accurately determine a distance via acoustic determination only. The problem solved by the '183 patent is that of extraneous noise interference that can occur while employing acoustic ranging techniques. The extraneous noise can falsely trigger the stop timer mechanism leading to inaccurate time measurements that are used in distance calculations.

To overcome this problem, the '183 patent employs a specific acoustic signal that is decoded upon reception and checked against the **expected** FSK sequence. If the sequence is correct the timer is stopped. The '183 patent knows the amount of time it takes to code the signal in the sending apparatus and de-code the signal in the receiving apparatus. Thus, if the timer is started when coding begins, and stops when decoding is complete, the actual transmit time can be determined by subtracting the coding time and the de-coding time from the total time.

The FSK sequence in the '183 patent is already stored in the receiving apparatus. It is **not** received as an RF signal as in the present invention. Thus, there is no "*comparing of the first digital audio samples against the second digital audio samples to determine if they match*" as is explicitly claimed in the present invention.

In addition, the Examiner has cited the '802 patent as teaching "converting the first digital audio samples to an analog waveform". The Examiner has merely selected a reference that includes a step of converting a signal from analog to digital. This is merely a digital-to-analog converter. Applicant takes exception to this combination because the context of the references are so different that one of reasonable skill in the art would not think to combine these references. The '602 patent is a system and method for measuring the send side (basestation) timing of the packets that comprise a modulated RF signal in a CDMA system for synchronization purposes. This has nothing whatsoever to do with the distance calculations addressed by the present invention. The Examiner could just as easily cited a standard D-to-A converter. The

motivation cited by the Examiner is to allow for " transmit[ting] the signal over a radio link". This reasoning is circumspect because a digital signal can and frequently is transmitted over a radio link. Thus, the motivation for the combination does not meet the standards set out in 35 USC 103(a).

Thus, the prior art combination of the '912, '802, and '183 patents does not (i) teach each element or step, nor (ii) provide a reasonable motivation for combining the references. Applicant respectfully requests that the 35 USC 103(a) rejection cited in paragraphs 7 and 8 of the most recent office action be reconsidered and withdrawn.

Applicant further requests that the rejections cited in paragraphs 9 - 12 of the most recent office action be reconsidered and withdrawn since they are dependent claims that depend from what applicant believes are allowable independent claims.

Respectfully submitted,

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